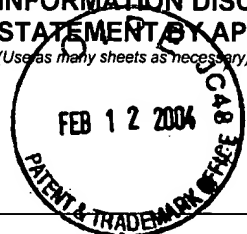


Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

Application Number	09/935232
Filing Date	August 22, 2001
First Named Inventor	Gilliam, Gary
Group Art Unit	2829
Examiner Name	Karlsen, Ernest

Sheet 1 of 1

Attorney Docket No: 303.221US4

**US PATENT DOCUMENTS**

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
	US-4,585,955	04/29/1986	Uchida, Yukimasa	307	297	11/30/1983

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T <sup>2</sup>
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**OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>4</sup>
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**EXAMINER****DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

2. (Previously Presented) The adaptive equalizer of Claim 1, further comprising a memory for storing received signal samples.

3. (Canceled)

4. (Previously Presented) The adaptive equalizer of Claim 1, wherein the means for adapting operates during decision-directed mode.

5. (Canceled)

6. (Previously Presented) The adaptive equalizer of Claim 1, wherein adaptation is performed using fixed-point arithmetic operations.

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (New) A high-speed, broadband, wireline modem including an adaptive equalizer having both a training mode and a decision-directed, non-training mode, the adaptive equalizer comprising:

at least one of: a forward path coupled to receive the signal samples, the forward path including a forward filter and a decision element, and a feedback path coupled between an output of the decision element and an input of the decision element, the feedback path including a feedback filter; and

means for adapting the one of said forward filter and said feedback filter based on a least squares error criterion performed substantially to the following computation:

$$F_{fast} = \lambda_i F_{fast},$$

$$c_n = F_{fast} \frac{e_p}{1 + e^T F_{fast} e_p},$$

$$F_{fast} = F_{fast} - c_n e^T F_{fast},$$

$$b_n = K_{fast} + A_{fast} c_n.$$

wherein  $F$ ,  $A$  and  $c$  are filter coefficients,  $e$  is the forward error prediction,  $\lambda$  is an error criterion, and  $b$  is a backward error predictor.

16. (New) The adaptive equalizer of Claim 15, further comprising a memory for storing received signal samples.

17. (New) The adaptive equalizer of Claim 15, wherein the means for adapting operates during decision-directed mode.

18. (New) The adaptive equalizer of Claim 15, wherein adaptation is performed using fixed-point arithmetic operations.

19. (New) A high-speed, broadband, wireline modem including an adaptive equalizer having both a training mode and a decision-directed, non-training mode, the adaptive equalizer comprising:

at least one of: a forward path coupled to receive the signal samples, the forward path including a forward filter and a decision element, and a feedback path coupled between an output of the decision element and an input of the decision element, the feedback path including a feedback filter; and

means for adapting the one of said forward filter and said feedback filter based on a least squares error criterion performed substantially to the following computation:

$$K_{fast} = (m - (D_{fast}\mu))/(1 - \eta^T\mu),$$

$$D_{fast} = D_{fast} - K_{fast}\eta^T.$$

wherein  $K$  is the Kalmann Gain,  $D$  is the backward predictor coefficients and  $m$ ,  $\mu$ , and  $\eta$  are backward prediction errors.

20. (New) The adaptive equalizer of Claim 19, further comprising a memory for storing received signal samples.

21. (New) The adaptive equalizer of Claim 19, wherein the means for adapting operates during decision-directed mode.

22. (New) The adaptive equalizer of Claim 19, wherein adaptation is performed using fixed-point arithmetic operations.

23. (New) A high-speed, broadband, wireline modem including an adaptive equalizer having both a training mode and a decision-directed, non-training mode, the adaptive equalizer comprising:

at least one of: a forward path coupled to receive the signal samples, the forward path including a forward filter and a decision element, and a feedback path coupled between an output of the decision element and an input of the decision element, the feedback path including a feedback filter; and

means for adapting the one of said forward filter and said feedback filter based on a least squares error criterion performed wherein a routine for updating said one of said forward filter and said feedback filter performs no more than  $22N$  multiplies, where  $N$  is the number of filter taps.

24. (New) The adaptive equalizer of Claim 23, further comprising a memory for storing received signal samples.

25. (New) The adaptive equalizer of Claim 23, wherein the means for adapting operates during decision-directed mode.

26. (New) The adaptive equalizer of Claim 23, wherein adaptation is performed using fixed-point arithmetic operations.